

REMARKS

Claims 1-6 are currently pending, none of which have been amended. No new claims have been added. It is respectfully believed that no new matter has been introduced.

The Examiner has objected to the disclosure because of an informality. In particular, the Examiner has suggested that the phrase "now U.S. Patent No. 6,639,280" should be inserted in the first sentence on page 1 of the specification. In response to this objection, the first sentence on page 1 of the specification has been amended to include the relevant phrase. Thus, Applicants respectfully submit that this objection should be withdrawn.

The Examiner has objected to the title because of an informality. In particular, the Examiner has noted that the title is not descriptive. In response to this objection, the title has been amended to include the phrase "facilitating cleaving" to remove the noted informality. Thus, Applicants respectfully submit that this objection should be withdrawn.

Before turning to the cited references, a brief review of the present invention is in order. The present invention provides advantageous effects including the following: the property of a semiconductor device formed on, or in, a device formation layer can be

improved and the substrate can be easily split into chips by cleaving (see page 5, lines 10-15 of the specification of the present application).

In the present invention, the direction of the scribe lines are related to the direction of the crystallographic axis. The direction of a crystallographic axis of the device formation layer is different from the direction of corresponding crystallographic axis of the supporting substrate. The direction of the scribe lines, which are defined on the device formation layer, is directly related to a crystallographic axis of the supporting substrate on which the scribe lines are not defined.

Claims 1-6 stand rejected under 35 USC 103(a) as being obvious over JP 09-246505 (**Kato**), USP 3,054,709 (**Freestone**), and USP 6,596,185 (**Lin**).

Applicants respectfully traverse this rejection.

Claim 1 sets forth “(b) forming semiconductor devices on the device formation layer within a plurality of areas divided by **scribe lines extending to a direction being parallel to a direction of a crystallographic axis** where the supporting substrate is easy to be cleaved; and (c) splitting the laminated substrate into a plurality of chips by cleaving the supporting substrate along the scribe lines” in combination with the other claimed features.

The Examiner has conceded that “**Kato** does not show the forming of scribe lines parallel to said axes, semiconductor devices formed between said scribe lines, grooves form through said device layer, splitting the substrate along said scribe lines and wirings form parallel to said axes” (Office Action mailed April 16, 2004, page 3, lines 12-14).

In view of the admitted deficiencies of **Kato**, the Examiner attempts to rely upon other art to remedy those deficiencies. In particular, the Examiner attempts to rely upon the teachings of **Freestone** and **Lin** to remedy the admitted deficiencies of **Kato**.

However, Applicants respectfully submit that the Examiner is misapplying the teachings of **Freestone**.

In the Office Action mailed April 16, 2004, on page 3, at lines 15-16, the Examiner alleges that “**Freestone et al.** teaches forming scribe lines parallel to the principle **axis** to form wafers with smooth edges and lines (col. 1, lines 39-41).” However, Applicants respectfully submit that this allegation by the Examiner demonstrates that the Examiner is misapplying the teachings of **Freestone**.

Freestone states, at column 1, lines 32-35, that “cutting the slice along a plane substantially parallel to a principal **plane** of the crystal, scribing on the slice a pattern

representing the lines of separation between the sections". Furthermore, **Freestone** states, at column 1, lines 58-61, that "The slice may be of about 0.020" thick and is preferably cut from the ingot in a manner such that the **face** of the slice is parallel to a principal plane, preferably a 1.1.1. plane, of the crystal."

Namely, **Freestone** defines crystal **face** orientation of the slice (wafer). **Freestone** mentions a method for scribing a slice at column 2, lines 5-20. However, **Freestone** does *not* describe, teach, or suggest the relationship between the scribing direction and the crystal **axis** direction at all, as set forth in the present claimed invention.

In view of the foregoing, **Freestone** and **Kato**, alone or in combination, fail to describe, teach, or suggest the following features of claim 1: "(b) forming semiconductor devices on the device formation layer within a plurality of areas divided by **scribe lines extending to a direction being parallel to a direction of a crystallographic axis** where the supporting substrate is easy to be cleaved; and (c) splitting the laminated substrate into a plurality of chips by cleaving the supporting substrate along the scribe lines", in combination with the other claimed features.

Furthermore, **Lin** does not remedy the above-described deficiencies of **Kato** and **Freestone**. In particular, **Lin** does not describe, teach, or suggest the relationship between

the scribing direction and the crystal axis direction, as set forth in the present claimed invention, either.

In contrast, in claim 1 of the present application, the direction of the scribe line is related to the direction of the crystallographic axis. The direction of a crystallographic axis of the device formation layer is different from the direction of corresponding crystallographic axis of the supporting substrate. The direction of the scribe lines which are defined on the device formation layer is directly related to a crystallographic axis of the supporting substrate on which the scribe lines are not defined. These features are not disclosed in the cited references: **Kato, Freestone, and Lin.**

Also, the present invention has advantageous effects in that the property of the semiconductor device formed on, or in, the device formation layer can be improved and the substrate can be easily split into chips by cleaving (see page 5, lines 10-15 of the specification of the present application). These advantageous effects of the present invention cannot be expected from the disclosures of the cited references: **Kato, Freestone, and Lin.**

In view of the foregoing, **Kato, Freestone, and Lin**, alone or in combination, fail to describe, teach, or suggest the following features of claim 1: “(b) forming semiconductor

devices on the device formation layer within a plurality of areas divided by **scribe lines extending to a direction being parallel to a direction of a crystallographic axis** where the supporting substrate is easy to be cleaved; and (c) splitting the laminated substrate into a plurality of chips by cleaving the supporting substrate along the scribe lines", in combination with the other claimed features.

Thus, Applicants respectfully submit that this rejection of claims 1-6 should be withdrawn.

In view of the aforementioned amendments and accompanying remarks, all claims are in condition for allowance, which action, at an early date, is requested.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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